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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/005,186	12/04/2001	David Malcolm Camm	FETHE24.001CP1	9133

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EXAMINER

FUQUA, SHAWNTINA T

ART UNIT	PAPER NUMBER
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3742

DATE MAILED: 03/12/2004

12

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/005,186

Applicant(s)

CAMM ET AL.

Examiner

Shawntina T. Fuqua

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-120 is/are pending in the application.
- 4a) Of the above claim(s) 66,71,89,90,96,117,119 and 120 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-65,67-70,72-88,91-95,97-116 and 118 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 4, 7-8, 11.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election with traverse of Species B, subspecies G1 drawn to claims 1-65, 67-70, 72-88, 91-95, 97-116, and 118 in Paper No. 10 is acknowledged. The traversal is on the ground(s) that a prior art search and examination of all pending claims would not pose a serious burden to the Examiner. This is not found persuasive because as pointed out by the applicant, the disclosed species are mutually exclusive and patentably distinct.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 66, 71, 89-90, 96, 117, and 119-120 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 10.

### ***Specification***

3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

4. The abstract of the disclosure is objected to because line 1 repeats information given in the title and lines 1 and 6 contains implied phrases. Correction is required. See MPEP § 608.01(b).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-22, 24-43, 45-49, 50-54, 59-65, 69, 72-76, 81-88, 93-94, 97-100, 104-116, and 118 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi (US5219786) in view of Camm (US5561735) and Gat et al (US5960158).

Noguchi discloses a method/system of heat treating a workpiece comprising increasing a temperature of the workpiece over a first time period to an intermediate temperature via a preheating device (5), rapidly heating the workpiece to a desired temperature greater than the intermediate temperature within less time than the first time period (column 2, line 66 – column 3, line 7, 17-23; Figure 1c) via a heating device of thermal flux or adiabatic energy (column 3, line 4), pre-heating the workpiece for a time period greater than a thermal conduction time of the workpiece (column 3, lines 37-40). Although Noguchi doesn't explicitly state "...preheating the workpiece for a time period greater than a thermal conduction time of the workpiece", it is inherent. In column 3, lines 37-40, Noguchi discloses that the polycrystalline silicon layer is preheated to 600 degrees Celsius and only needs to be increased by 800 degrees Celsius to reach

the heating temperature of 1400 degrees Celsius. Figure 1A depicts the arc lamp (5) irradiating a surface of the workpiece while the polycrystalline silicon layer (4) is located on the opposite surface as depicted in Figure 1B. In order for the polycrystalline silicon layer to be preheated to 600 degrees Celsius, heat from the arc lamp must be conducted through surface 1 of the workpiece to reach the polycrystalline layer of the workpiece and elevate its temperature to 600 degrees Celsius. Noguchi goes on to disclose heating the surface of the workpiece for a time period less than a thermal conduction of the workpiece (column 2, line 67 – column 3, 1-3, 10-11, 17-21; Figure 1c), heating the workpiece at the end of the first time period (column 3, lines 17-22), a temperature indicator (7) for producing an indication of a temperature of the workpiece (column 2, lines 51-55), commencing heating in response to an indication that the temperature of the workpiece via the temperature indicator has reached the indicated temperature. Although Noguchi doesn't explicitly state that heating is started once the workpiece has reached the intermediate temperature, it is inherent. Noguchi discloses a temperature indicator for measuring the temperature of the wafer, and in column 3, lines 5-7, Noguchi discloses that a trigger signal is given to actuate the laser when the workpiece is heated at 600 degrees Celsius. It is inherent that the temperature indicator indicates when the workpiece temperature has reached 600 degrees Celsius and this information is used to send a signal which starts the heating process of raising the temperature by 800 degrees Celsius to reach its target of 1400 degrees Celsius. Noguchi goes on to disclose preheating as well as heating the workpiece by irradiating the workpiece via an arc lamp (column 2, line 66 – 67) and pulse excimer laser (column 2, lines 59-61, column 3, lines 1-3), irradiating a first side of the workpiece to pre-heat the workpiece to an intermediate temperature and heating comprises irradiating a second side of the workpiece to heat the second

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side to the desired temperature (column 2, line 66 – column 3, line 4; Figures 1a and 1b), first and second sides comprises irradiating a substrate side (2) and device side (4), irradiating a first side for a time period greater than a thermal conduction time of the workpiece and irradiating the second side for a time period less than a thermal conduction time of the workpiece (column 3, lines 37-40), irradiating a first side via an arc lamp (5), and a first irradiance source (5) to irradiate a first side (2) of the workpiece to pre-heat the workpiece to an intermediate temperature and a second irradiance source to irradiate a second side of the workpiece to a desired temperature (column 2, line 66 – column 3, line 7, 17-23; Figure 1c). Noguchi does not disclose enhancing cooling of the workpiece by absorbing the radiation reflected and thermally emitted by the workpiece at a radiation absorbing surface such as a wall of the chamber which is cooled and with a selective filtering system located between the workpiece and the heating device wherein the selective filtering system comprises a first and second window which define a passageway for flowing a cooling water. Camm discloses enhancing cooling of the workpiece by absorbing the radiation reflected and thermally emitted by the workpiece at a radiation absorbing surface such as a wall of the chamber which is cooled (column 5, lines 14-22) and Gat et al discloses a selective filtering system located between the workpiece and the heating device wherein the selective filtering system comprises a first and second window which define a passageway for flowing a cooling water (column 7, line 50- column 9, line 20). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included the radiation absorbing environment of Camm along with the selective filtering system of Gat et al in the method/system of Noguchi because, a radiation absorbing environment and selective spectral filter allows the workpiece to be heated and cooled more efficiently.

7. Claims 21, 44, 67-68, and 91-92 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi in view of Camm and Gat et al as applied to claims 1, 25, 54, and 76 above, and further in view of Camm et al (US6303411).

Noguchi in view of Camm and Gat et al discloses all of the recited subject matter except a ramp rate of at least 100 degrees Celsius per second and a ramp rate of at least 400 degrees Celsius per second. Camm et al discloses a ramp rate of at least 100 degrees Celsius per second and at least 400 degrees Celsius per second (column 4, lines 39-41). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included the ramp rate of Camm et al in the method/system of Noguchi along with the radiation absorbing environment of Camm and selective filter of Gat et al because, ramp rates of at least 100 degrees Celsius per second and at least 400 degrees Celsius per second allows the surface of the workpiece to be heated more efficiently and quickly.

8. Claims 23, 70, and 95 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi as applied to claims 1, 54, 76, and 94 above, and further in view of Kirkpatrick (US4151008).

Noguchi in view of Camm and Gat et al discloses all of the recited subject matter except irradiating the workpiece via a flash lamp. Kirkpatrick discloses irradiating a workpiece via a flash lamp (column 3, lines 31-33, column 4, lines 34-38). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included the flash lamp of Kirkpatrick in the method/system of Noguchi along with the radiation absorbing environment of Camm and selective filter of Gat et al because, a flash lamp delivers a short duration pulse to the workpiece momentarily elevating the temperature of the area to be treated.

*Allowable Subject Matter*

9. Claims 55-58, 77-80, and 101-103 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

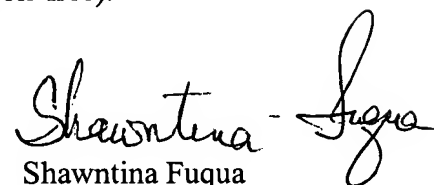
*Conclusion*

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shawntina T. Fuqua whose telephone number is (703) 305-2581. The examiner can normally be reached on Monday-Friday 8-4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Teresa Walberg can be reached on (703) 308-1327. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

stf  
March 6, 2004

  
Shawntina Fuqua  
Patent Examiner  
Art Unit 3742